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SCIENCE ABSTRACTS.

SECTION A.—PHYSICS.

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ERRATA.

Section A.—PHYSICS.

Abstract No. 6, line 9: *for* Lorenz's, *read* Lorentz's.
Abstract No. 18, line 2: *for* McCane, *read* McCaw.
Abstract No. 59, line 2: *for* R. F. Kovarik, *read* A. F. Kovarik.
Abstract No. 106, line 1: *for* Luplau-Jansen *read* Luplau-Janssen.
Abstract No. 124, line 4: *for* Richtmeyer, *read* Richtmyer.
Abstract No. 142, line 1: *for* A. G. Egerton, *read* A. C. Egerton.
Abstract No. 265, line 3: *for* Am. Chem. Soc. J., *read* Am. Soc. Mech. Eng., J.
Abstract No. 300, p. 113, line 8: *for* Houston, *read* Houstoun.
Abstract No. 305, p. 135, line 2: *for* Detsch, *read* De ch.
Abstract No. 338, line 3: *for* 0·092 % carbon, *read* 0·92 % carbon.
Abstract No. 362, line 1: *for* Bergers, *read* Burgers.
Abstract No. 599, line 3: *for* radiations, *read* radiation.
Abstract No. 642, line 5: *for* v. Bayer, *read* v. Baeyer.
Abstract No. 1096, p. 459, line 25: *for* authors, *read* author.
Abstract No. 1289, p. 535, line 4 from end: *for* Mandelstamm, *read* Mandelstam.
Abstract No. 1330, line 2: *for* F. C. Hostetter, *read* J. C. Hostetter.

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No. 5347

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LIST OF JOURNALS.

In 1917 Abstracts were made from the following Journals. An (*) Asterisk indicates that the Journals so marked were received only occasionally.

Abbreviation.	Full Title.	Price.	Publishers, or Agents.
Akad. Wiss. Wien, Ber.	Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften, Wien	Varies for separate copies	Published by the Academy
Am. Acad., Proc.	Proceedings of the American Academy of Arts and Sciences	——	Published by the Academy, 28, Newbury Street, Boston, Mass.
Am. Chem. Soc., J.	Journal of the American Chemical Society	$6 per annum	Published by the Society, Easton, Pa.
Am. Electrochem. Soc., Trans....	Transactions of the American Electrochemical Society	$3 per volume	Lehigh University, South Bethlehem, Pa.
Am. Illum. Eng. Soc., Trans. ...	Transactions of the American Illuminating Engineering Society	Single copy, 75 cents; $5 per annum	29 West 39th Street, New York
Am. I.E.E., Proc.	Proceedings of the American Institute of Electrical Engineers	Single copy, $1; $12 per annum	33 West 39th Street, New York
Am. Inst. Mining Eng., Bull. ...	Bulletin of the American Institute of Mining Engineers	Single copy, $1; $12 per annum	212–18, York Street, York, Pa., U.S.A.
Am. J. Sci.	American Journal of Science	Single copy, 50 cents; $6.40 per annum, post free	Morehouse & Taylor Co., 123,, Temple Street, New Haven, Connecticut, U.S.A.
Am. Phil. Soc., Proc.	Proceedings of the American Philosophical Society	$5 per volume	104, South Fifth Street, Philadelphia, U.S.A.
Am. Soc. Mech. Eng., J.	Journal of the American Society of Mechanical Engineers	Single copy, 35 cents; $4 per annum, post free	29 West 39th Street, New York.
Ann. d. Physik	Annalen der Physik	54 marks per annum ...	J. A. Barth, Dörrienstrasse 16, Leipzig
Annales des Postes, Télég. et Téléphones	Annales des Postes, Télégraphes et Téléphones	12 francs per annum ...	A. Dumas, 6, Rue de la Chaussée-d'Antin, Paris
Arch. d'Él. Médicale.....	Archives d'Électricité Médicale	Single copy, 2 francs; 28 francs per annum, post free	6bis, Rue du Temple, Bordeaux
Archives des Sciences.....	Archives des Sciences Physiques et Naturelles, Genève	Single copy, 3 francs; 30 francs per annum, post free	Bureau des Archives, Rue de la Pélisserie 18, Geneva

Abbreviation.	Full Title.	Price.	Publishers, or Agents.
Archiv f. Elektrot.	Archiv fur Elektrotechnik	24 marks per annum	J. Springer, Linkstrasse 23–24, Berlin, W. 9
Astron. J.	Astronomical Journal	—	Dudley Observatory, Albany, N.Y., U.S.A.
*Astron. Nach.	Astronomische Nachrichten	—	—
Astrophys. J.	Astrophysical Journal	Single copy, 76 cents; $5.62 per annum, post free	The University of Chicago Press, Chicago, Illinois, U.S.A
Automotor J.	Automotor Journal	Single copy, 1d.; 7s. per annum	36, Great Queen Street, Kingsway, London, W.C. 2
Bureau of Mines, Techn. or Sci. Papers	Technical or Scientific Papers of the Bureau of Mines (Department of Interior)	—	Government Printing Office, Washington
Bureau of Standards, Bull.	Bulletin of the Bureau of Standards	—	Government Printing Office, Washington
Cambridge Phil. Soc., Proc.	Proceedings of the Cambridge Philosophical Society	Price varies	Deighton, Bell & Co., and Bowes & Bowes, Cambridge, and C. F. Clay, Fetter Lane. London, E.C. 4
Cambridge Phil. Soc. Trans.	Transactions of the Cambridge Philosophical Society	Price varies	Deighton, Bell & Co., Ltd., and Bowes & Bowes, Cambridge, and C. F. Clay, Fetter Lane, London, E.C. 4
Canad. Elect. News	Canadian Electrical News	$2 per annum, post free	H. G. MacLean, Ltd., 347 Adelaide Street, West, Toronto
Chem. Eng. and Mining Rev.	Chemical Engineering and Mining Review (Incorporating the Mining and Engineering Review)	7s. 6d. per annum	Scottish House, 90, William Street, Melbourne, Australia
Chem. News	Chemical News and Journal of Physical Science	Single copy, 4d.; £1 per annum, post free	16, Newcastle Street, Farringdon Street, London, E.C.
Chem. Soc., J.	Journal of the Chemical Society	—	Gurney & Jackson, 33, Paternoster Row, London, E.C.
Comptes Rendus	Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences	44 francs per annum, post free	Gauthier-Villars & Cie., Quai des Grands-Augustins, 55, Paris
Elect. J.	The Electric Journal	Single copy, 15 cents; $2 per annum, post free	200, Ninth Street, Pittsburgh, Pa.
Electrician	The Electrician	Single copy, 7d.; 28s. per annum, post free	8, Bouverie Street, E.C. 4

Abbreviation.	Full Title.	Price.	Publishers, or Agents.
Električestvo	Električestvo	12 roubles per annum	7 Roschdestwenskaja ı, Petrograd
Elektrot. u. Maschinenbau	Elektrotechnik und Maschinenbau	6.50 francs per annum	Theobaldgasse, 12, Wien, 6
Elekt. Zeits.	Elecktrotechnische Zeitschrift	20 marks per annum	J. Springer, Linkstrasse 23–24, Berlin, W. 9
Elettricità, Milan	L'Elettricità, Milan	Single copy, 50 cents; 25 lire per annum	F. E. Fumero, 31 Corso Magenta, Milan
Elettrotecnica	L'Elettrotecnica	30 lire per annum, post free	Via S. Paolo, No. 10, Milan, Italy.
El. Rev.	The Electrical Review (London)	Single copy, 4d. £1 1s. 8d. per annum, post free	4, Ludgate Hill, London, E.C. 4
El. Rev. and West. Electn. (*now* El. Rev., Chicago	The Electrical Review and Western Electrician (now the Electrical Review, Chicago	Single copy, 15 cents; $7 50 per annum, post free	53, W. Jackson, Blvd. 515–519, Monadnock Block, Chicago
El. Rly. J.	Electric Railway Journal	Single copy, 10 cents; $6 per annum, post free	Mc Graw Hill Publishing Co., 239 West 39th Street, New York
El. Times	Electrical Times	Single copy, 2d.; 10s. 6d. per annum, post free	Sardinia House, Sardinia Street, Kingsway, W.C.
El. World	Electrical World	Single copy, 10 cents; $5.00 per annum, post free	Mc Graw Hill Publishing Co., 239, West 39th Street, New York
Eng. Club Phil., J.	Journal of the Engineers' Club of Philadelphia	Single copy, 50 cents; $4 per annum, post free	227, South Sixth Street, Philadelphia
Engineer	Engineer	Single copy, 10d.; £2 2s. 6d. per annum, post free	33, Norfolk Street, Strand, W.C. 2
Engineering	Engineering	Single copy, 8d.; £2 4s. 6d. per annum, post free	35 & 36, Bedford Street, Strand, W.C. 2
Eng. News-Record	Engineering News-Record	Single copy, 15 cents; $9 per annum, post free	McGraw Hill Publishing Co., 10th Avenue at 36th Street, New York and 6 Bouverie Street, London, E.C.

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Abbreviation.	Full Title.	Price.	Publishers, or Agents.
Faraday Soc., Trans.	Transactions of the Faraday Society	Varies for separate copies	82, Victoria Street, London, S.W. 1.
Frank. Inst., J.	Journal of the Franklin Institute	Single copy, 50 cents; $5 per annum	Franklin Institute, Philadelphia, Pa.
Gen. El. Rev.	General Electrical Review	Single copy, 20 cents; $2.50 per annum	General Electric Co.'s Publication Bureau, Schenectady, New York, U.S.A.
Illum. Eng., London	Illuminating Engineer	Single copy, 1s.; 10s. 6d. per annum	32, Victoria Street, London, S.W.
*Ind. Eng. Chem., J.	Journal of Industrial and Engineering Chemistry	—	—
*Indust. Management	Industrial Management	Single copy, 25 cents; 16s. 6d. per annum	Engineering Magazine Co. Publishers, 6, East 39th Street, New York, U.S.A.
Inst. Civ. Eng., Proc.	Proceedings of the Institution of Civil Engineers	—	11, Great George Street, London, S.W.
Inst. El. Eng., J.	Journal of the Institution of Electrical Engineers	Price varies	E. & F. N. Spon, Ltd. 57, Haymarket, London, S.W., and Spon & Chamberlain, 123, Liberty Street, New York
Inst. Eng. and Shipbuilders, Trans.	Transactions of the Institution of Engineers and Shipbuilders in Scotland	—	39, Elmbank Crescent, Glasgow
Inst. Marine Eng., Trans.	Transactions of the Institute of Marine Engineers	—	The Minories, Tower Hill, London, E.C.
Inst. Mech. Eng., J.	Journal of the Institution of Mechanical Engineers	—	Storey's Gate, St. James's Park, S.W. (temporary address), 11, Great George Street, S.W.
Inst. Naval Architects, Trans.	Transactions of the Institution of Naval Architects	—	5, Adelphi Terrace, W.C.
Inst of Metals, J.	Journal of the Institute of Metals	—	36, Victoria Street, Westminster, S.W.1
Inst. Radio Eng., Proc.	Proceedings of the Institute of Radio Engineers	$6.60 per annum, post free	111, Broadway, New York
Iron and Steel Inst., J.	Journal of the Iron and Steel Institute	—	Published by the Institute, 28 Victoria Street, London, S.W. 1, and E. & F. N. Spon, Ltd., 57, Haymarket, and Spon & Chamberlain, 123, Liberty Street, New York
*J. of Agriculture, N.Z.	Journal of Agriculture	Single copy, 6d.; 2s. 6d. per annum	Department of Agriculture, Wellington, New Zealand

LIST OF JOURNALS—*continued.*

ABBREVIATION	FULL TITLE.	PRICE.	PUBLISHERS, OR AGENTS.
Jahrb. d. Drahtl. Tele.	Jahrbuch der Drahtlosen Telegraphie und Telephonie	—	M. Krayn, Berlin, W.
Journ. de Physique	Journal de Physique	18 francs per annum	124, Grande Rue, Bourg la Reine, Seine
J. Phys. Chem.	Journal of Physical Chemistry	$4 per annum	Ithaca, N.Y.
Journ. Télégraph.	Journal Télégraphique	Single copy, 50 cent.; 5 francs per annum, post free	Bureau Internationale de l'Union Télégraphique, Berne
K. Akad. Amsterdam, Proc.	Proceedings of the Koninklijke Akademie van Wetenschappen te Amsterdam	—	Published by the Academy
Kyoto Univ. Coll. Sci., Mem.	Memoirs of the College of Science, Kyoto Imperial University	Varies for separate copies	The College of Science, Kyoto Imperial University, Kyoto, Japan & Maruzen Co., Ltd., Kyoto, Japan
Lick Observat., Bull.	Bulletin of the Lick Observatory	—	Lick Observatory, University of California, Mt. Hamilton, California
Manchester Lit. and Phil. Soc., Proc.	Memoirs and Proceedings of the Manchester Literary and Philosophical Society	Price varies	36, George Street, Manchester
Math. Phys. Soc., Tōkyō, Proc.	Proceeedings of the Tōkyō Mathematical Physical Society	Single copy, 0.30 yen; 3.50 yen per annum, post free.	College of Science, Tōkyō Imperial University, Tōkyō, Japan.
Mech. Eng.	The Mechanical Engineer	Single copy, 3d.; 12s. 6d. per annum, post free	53, New Bailey Street, Manchester
Met. and Chem. Eng.	Metallurgical and Chemical Engineering	Single copy, 25 cents; $4 per annum, post free	239, West 39th Street, New York
Mining and Eng. Rev.	Mining and Engineering Review (now Chemical Engineering and Mining Review)	7s. 6d. per annum	Scottish House, 90, William Street, Melbourne, Australia
Monthly Weather Rev.	Monthly Weather Review	—	Government Printing Office, Washington
Nat. Acad. Sci., Proc.	Proceedings of the National Academy of Sciences	$5 per annum	2419–2421, Greenmount Avenue, Baltimore, Ma.
Nature	Nature	Single copy, 6d.	Macmillan & Co., Ltd., St. Martin's Street, London, W.C.
N. Cimento	Nuovo Cimento	20 lire per annum, post free	A. Stefanini, Lung'Arno Regio, 24, Pisa, Italy

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Abbreviation.	Full Title.	Price.	Publishers, or Agents.
Observatory	The Observatory	13s. per annum	Taylor & Francis, Red Lion Court, Fleet Street, E.C. 4
Phil. Mag.	Philosophical Magazine and Journal of Science	2s. 6d. monthly, occasionally 5s.	Taylor & Francis, Red Lion Court, Fleet Street, E.C. 4
Phot. J.	The Photographic Journal	Single copy, 1s.	Royal Photographic Society of Great Britain, 35, Russell Square, London, W.C.
Phys. Rev.	The Physical Review	Single copy, 60 cents; $6 per annum, post free	41, North Queen Street, Lancaster, Pa.
Phys. Soc., Proc.	Proceedings of the Physical Society of London	Single copy, 4s. 3d.; 20s. per annum, post free	The Fleetway Press, Ltd., 1, 2, and 3, Salisbury Court, Fleet Street, E.C.
Phys. Zeits.	Physikalische Zeitschrift	37.50 marks per annum, post free	S. Hirzel, Königstrasse 2, Leipzig
Post Office El. Eng., J.	Journal of the Post Office Electrical Engineers	Single copy, 1s.; 5s. per annum	4, Ludgate Hill, London, E.C.
Power	Power	Single copy, 5 cents; $5 per annum, post free	10th Avenue at 36th Street, New York
Preuss. Akad. Wiss. Berlin, Ber.	Sitzungsberichte der königlich Preussischen Akademie der Wissenschaften zu Berlin	12 marks per annum	Published by the Academy
Rev. de Mét.	Revue de Métallurgie	Single copy, 4 fr. 50 cents; 40 francs per annum, post free	7, Rue de Madrid, Paris
Rev. Gen. d'Él.	Revue Générale de l'Électricité	Single copy, 1 franc 50 cent; 50 francs per annum, post free	12, Place de Laborde, Paris
Roentgen Soc., J.	Journal of the Roentgen Society	Single copy, 4s.; 16s. per annum	Percy Lund, Humphries & Co., Ltd., 3, Amen Corner, London, E.C., and The Country Press, Bradford
Roy. Astron. Soc. Canada, J.	Journal of the Royal Astronomical Society of Canada	Single copy, 25 cents; $2 per annum	198, College Street, Toronto, Ontario, and William Wesley & Sons, 28, Essex Street, Strand.
Roy. Astron. Soc., Mem.	Memoirs of the Royal Astronomical Society	—	Royal Astronomical Society, Burlington House, London, W., and William Wesley & Sons, 28, Essex Street, Strand.
Roy. Astron. Soc., M.N.	Monthly Notices of the Royal Astronomical Society	Single copy, 2s. 6d.	Royal Astronomical Society, Burlington House, London, W., and William Wesley & Sons, 28, Essex Street, Strand.

ABBREVIATION.	FULL TITLE.	PRICE.	PUBLISHERS, OR AGENTS.
Roy. Dublin Soc., Proc.	Scientific Proceedings of the Royal Dublin Society	Varies for separate parts	Published by the Society, Leinster House, Dublin, and Williams & Norgate, 14, Henrietta Street, Covent Garden, London, W.C.
Roy. Irish Acad., Proc.	Proceedings of the Royal Irish Academy	Varies for separate copies	Hodges, Figgis & Co., Ltd., 104, Grafton Street, Dublin, and Williams & Norgate, 14 Henrietta Street, Covent Garden, W.C.
Roy. Meteorolog. Soc., J.	Quarterly Journal of the Royal Meteorological Society.	5s. per copy.	Edward Stanford, Ltd., 12, 13 & 14, Long Acre, London, W.C. 2.
Roy. Soc. Canada, Trans.	Transactions of the Royal Society of Canada	Single copy, 50 cents ...	Royal Society of Canada, Ottawa
Roy. Soc. Edinburgh, Proc.	Proceedings of the Royal Society of Edinburgh	Price varies	R. Grant & Son, 107, Princes Street, Edinburgh, and Williams & Norgate, 14, Henrietta Street, Covent Garden
Roy. Soc. Edinburgh, Trans.	Transactions of the Royal Society of Edinburgh	Price varies	R. Grant & Son, 107, Princes Street, Edinburgh, and Williams & Norgate, 14, Henrietta Street, Covent Garden
Roy. Soc., Phil. Trans.	Philosophical Transactions of the Royal Society of London	Price varies	Harrison & Sons, 45, St. Martin's Lane, London, W.C.
Roy. Soc., Proc.	Proceedings of the Royal Society of London	Varies for separate copies; Ser. A, 15s. per volume	Harrison & Sons, 45, St. Martin's Lane, London, W.C.
Russian Physico-Chemical Soc., J.	Jurnal Russkago Fisiko-Chimičeskago Obščestva. (Physical Part)	9 roubles per annum	Published by the Society, Imperial University, Petrograd
Schweiz. Elektrot. Verein, Bull.	Schweizerische Elektrotechnischer Verein, Bulletin	Single copy, 1 franc 50; 25 francs per annum, post free	Hirschengraben, 80/82, Zurich, 1
Scientific American	Scientific American	Single copy, 10 cents ...	Munn & Co., 233, Broadway, New York
Smithsonian Misc. Coll.	Smithsonian Miscellaneous Collections ...	——	Published by the Smithsonian Institute, Washington
Soc. Arts, J.	Journal of the Royal Society of Arts	6d. per copy	G. Bell & Sons, Ltd., York House, Portugal Street, W.C.

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Abbreviation.	Full Title.	Price.	Publishers, or Agents.
Soc. Int. Élect., Bull.	Bulletin de la Société Internationale des Électriciens	Single copy, 3 francs; 32 francs per annum, post free	Gauthier-Villars et Cie., 55 Quai des Grands-Augustins, Paris
Soc. Spettroscop. Ital., Mem. ...	Memorie della Società degli Spettroscopisti Italiani	20 L. per annum	The Observatory, Catania, Italy
Terrest. Magn.....	Terrestrial Magnetism and Atmospheric Electricity	Single copy, 90 cents; $2.5 per annum, post free	36th Street and Broad Branch Road, Washington, D.C., U.S.A.
Tôhoku Univ., Sci. Reports	Science Reports of the Tôhoku Imperial University	——	Tôhoku Imperial University, Sendai, Japan
Tôhoku Math. J.	Tôhoku Mathematical Journal	6s. per vol. of 4 numbers	Y. Okura, No. 19, Tôri-itchôme, Nihonbasi, Tôkyô, Japan, and Maruzen, Co., Ltd., Branch Office, Kokubuncho, Sendai, Japan.
*Union Obs. S. Africa, Circ. ...	Circulars of the Union Observatory of S. Africa	——	——
Univ. of Illinois, Eng. Exp. Sta., Bull.	Bulletin of the Engineering Experiment Station of the University of Illinois	——	University of Illinois, Urbana, Ill., and Chapman & Hall, Ltd., Lond n.
Washington Acad. Sci., J.	Journal of the Washington Academy of Sciences	Single copy, 25 cents; $6 per volume	2419–2421, Greenmount Avenue, Baltimore, Ma., U.S.A.
West. Soc. Eng., J.	Journal of the Western Society of Engineers	Single copy, 50 cents; $3 per volume of 10 numbers	1735, Monadnock Block, Chicago, U.S.A.
*Wireless Wld.	*Wireless World	Single copy, 7d.; 9s. per annum, post free	Marconi House, Strand, London, W.C.
Zeits. Instrumentenk.	Zeitschrift für Instrumentenkunde	24 marks per annum.....	J. Springer, Linkstrasse 23–24, Berlin, W. 9
Zeits. Vereines Deutsch. Ing. ...	Zeitschrift des Vereines Deutscher Ingenieure	Single copy, 1.60 M.; 40 M. per annum, post free	J. Springer, Linkstrasse 23–24, Berlin, W. 9

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